

# BLUE RIDGE ENVIRONMENTAL DEFENSE LEAGUE

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June 25, 2001

Dr. Jane R. Summerson, EIS Document Manager  
Yucca Mountain Site Characterization Office  
Office of Civilian Radioactive Waste Management  
U.S. Department of Energy  
P.O. Box 30307, M/S 010  
North Las Vegas, NV 89036-0307  
Fax: 1-800-967-0739

RECEIVED

JUN 26 2001

Re: *Supplement to the Draft Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada (DOE/EIS-0250D-S)*

Dear Dr. Summerson:

On behalf of the Blue Ridge Environmental Defense League, I write in opposition to the Department of Energy's plans for a geologic repository for high-level nuclear waste at Yucca Mountain.

The Blue Ridge Environmental Defense League organized in March of 1984 in opposition to the US Department of Energy's siting search for an eastern high-level nuclear waste dump. Working with a broad national coalition, we blocked DOE's Crystalline Repository Project. In May of 1987 we convened the Maryville, Tennessee Conference on High-level Nuclear Waste Transportation in the South, which created the Southern Environmental Network. SEN went on to defeat the Monitored Retrievable Storage proposal in Tennessee. Since 1985 we have maintained our opposition to a high-level nuclear dump in Nevada by mounting a 10,000+ mile transport corridor campaign using a full-size, mobile replica of a nuclear waste transport cask. We maintain our working relationships with other powerful citizens' groups throughout the country.

## Plutonium Fuel's Impact on High-level Waste Ignored By DOE

The proposed use of plutonium oxide as a component of civilian nuclear reactor fuel alters the nature of the irradiated fuel waste which would be accepted by a geologic repository. For eight years the Department of Energy has pursued a plan to use 33 tons of dismantled-weapons plutonium as fuel, yet I can find no reference to this in any documents prepared by the DOE's Office of Civilian Radioactive Waste Management. This oversight must be corrected before the project moves forward.

In 1993 President Clinton announced America's post-Cold War plan for weapons of mass

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destruction. He committed the United States to an approach which would eliminate stockpiles of highly enriched uranium and plutonium. In 1996 Secretary of Energy Hazel R. O'Leary released a blueprint in which three plutonium technologies were outlined: immobilization in glass or ceramic form, reactor use as mixed oxide fuel, and burial in a deep borehole either directly or in immobilized form.

In December 1998 United States Secretary of Energy Bill Richardson announced the preferred site for conversion of the plutonium warhead pits into civilian nuclear power reactor fuel. In March 1999 the DOE contracted with Duke Engineering & Services, Cogema, Inc., and Stone & Webster to provide fuel fabrication and commercial reactor services for DOE's surplus plutonium plan. DCS plans to modify four existing Duke Power reactors for mixed oxide fuel: two each at Catawba in York, SC and McGuire in Huntersville, NC.

On January 4, 2000 the Department of Energy issued a Record Of Decision to process up to 50 metric tons of US surplus plutonium at Savannah River Site. The mixed approach would immobilize approximately 17 metric tons of surplus plutonium and use up to 33 metric tons as mixed oxide, or MOX, fuel.

According to the Nuclear Control Institute, MOX fuel has a greater quantities of plutonium and other hazardous radioactive isotopes such as Americium 241 and Curium 242—actinide elements which would cause additional harmful radiation exposure to the public. A reactor using weapons-grade MOX fuel in one-third of its core contains, on average, about three times more plutonium 239, five times more americium 241, and four times more curium 242 than a reactor using only low enriched uranium fuel.

French test results suggest that plutonium fuel is more unstable than uranium fuel. In 1997 a MOX fuel rod violently ruptured when subjected to test conditions designed to simulate an accident. The uranium fuel rod in that test did not rupture. A letter from the NRC Advisory Committee on Reactors Safeguards states,

"We are aware of experimental studies that show there to be enhanced release of fission gases to the fuel-cladding gap during reactor operations with MOX relative to conventional fuels. This may simply be an effect caused by fuel temperature. We are also aware of anecdotal accounts of the results of VERCOURS tests in France dealing with the release of volatile radionuclides such as cesium from MOX under severe accident conditions. Results of these tests revealed that during the early stages of core degradation, releases of volatile radionuclides from MOX are more extensive than from conventional fuels at similar levels of burnup."

Advisory Committee on Reactor Safeguards letter to Nuclear Regulatory Commission Chairman, May 17, 1999

Mixed oxide fuel adds plutonium and its radioactive daughters to the irradiated fuel waste. Transport impacts may also be increased by the presence of volatile radio-nuclides. These issues must be addressed by the DOE's Draft Environmental Impact Statement for a geologic repository.

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**Geology At Yucca Mountain Is Unsuitable For Long Term Isolation of Waste**

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3 A repository for high-level nuclear waste at Yucca Mountain could become an environmental and health disaster, perhaps within a few generations. The problems include seismic activity, volcanism, human intrusion, and water percolation time of only 50 years. DOE documents reveal that the present climate in Nevada is about half as wet as the long-term average for Yucca Mountain. And the area has experienced periods of up to three times the present annual rainfall. A serious earthquake may occur every 1,000 years. Very hot geothermal water could rise into the repository from below. Cracks would allow water to flow from above. The quake could destroy waste canisters. Furthermore, the evidence shows that significant amounts of radionuclides are likely to migrate off-site to groundwater that is currently suitable for human consumption and crop irrigation.

Geologic faults are critical elements in determining the earthquake hazard at Yucca Mountain. Geophysical investigations of faulting, the lengths and the amount of offset along them, have been done by the US Geological Survey at the proposed nuclear waste repository at Yucca Mountain.

Magnetic data along 29 profiles and gravity data along 13 profiles are reported along the central block of Yucca Mountain. The study area is about 130 km northwest of Las Vegas in the southwest quadrant of the Nevada Test Site (NTS) and is bounded by Yucca Wash to the north, Amargosa Valley to the south, Crater Flat to the west, and Jackass Flats to the east.

Geophysical data reveal that Midway Valley is characterized by several known and previously unknown faults, that the existence of the Yucca Wash fault is equivocal, and that the central part of the eastern flank of Yucca Mountain is characterized by numerous small-scale faulting. Gravity and magnetic data also reveal several large-amplitude anomalies that reflect larger-scale faulting along the margins of the central block.

*Ponce, D.A., 1996, Interpretive geophysical fault map across the central block of Yucca Mountain, Nevada: U.S. Geological Survey Open-File Report 96-285, 15 p. Available from the USGS-Information Services, Box 25286, Bldg. 810, Denver Federal Center, Denver, CO 80225 303 236-4210.*

Experts say that 30 percent of the waste canisters could be affected by water seepage after burial in the repository. Water and 400+ degree temperatures caused by the radioactive waste could speed corrosion of the waste casks. To counteract this, DOE plans to surround casks with a corrosion-resistant ceramic coating over 3 inches of steel, followed by a 3/4-inch layer of Alloy 22—a special corrosion-resistant metal. Even with this added protection, DOE admits the first casks will probably be breached by pinhole-size leaks within 1,000 years. The degradation process would be greatly speeded up by a tunnel collapse, or denting or cracking of waste canisters.

Nevada Nuclear Projects Agency Director Bob Loux says the danger of water in the repository is twofold: rain water from above and groundwater from an aquifer 300 feet below pushed up by an

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earthquake. Loux says there is evidence of intrusion by hot geothermal water from below in the crystalline rock at proposed repository depths. This could occur again. The issue was first raised by a former DOE employee, Jerry Szymanski, who reported evidence of past geothermal activity at the proposed site.

DOE maintained for many years that it takes thousands of years for rain water seep into Yucca Mountain to repository depths. But recently scientists found water containing radioactivity which could only have come from atomic testing. Using chlorine-36 as a tracer, residues from rainwater less than 50 years old have been detected at the level of the proposed repository 800 feet below ground. This contradicts earlier models of rainwater travel time to the water table. This alone should have disqualified the site based on the speed of groundwater flow through the mountain.

To find out what 400+ degree temperatures generated by thousands of nuclear waste canisters buried inside the mountain would do to the surrounding rock, DOE scientists have installed electric heating elements in tunnels nearly 800 feet below ground. The heaters will be used for four years before the temperature is brought down slowly to mimic the declining temperature of the irradiated fuel. According to a mining engineer overseeing the construction and testing in Yucca Mountain, the heat has expanded the rock, tightening some of the fractures in it. But two weeks after the heaters were turned on, water forced from the apparently dry rock began dripping into the main tunnel. This raises the possibility that heat could cause water to drip onto nuclear waste canisters, greatly speeding their deterioration.

Scientists at Cal-Tech and Harvard reported that Yucca Mountain's crust is moving 10 times faster than DOE estimates. The data records 621 seismic events registering 2.5 or higher on the Richter scale since 1976.

Yucca Mountain is made of "tuff," layers of ash and debris deposited by a series of volcanoes in the area 11 million to 15 million years ago. The mountain was raised from the desert floor in a series of earthquakes. The mountain is riddled with cracks and major fractures. Thirty-three seismic faults are in the vicinity, with two running through the proposed nuclear waste repository site. Remnants of eleven volcanoes surround Yucca Mountain: eight older volcanoes which created it are to the north, while three more recent volcanic cinder cones are lie to the south. The long history of seismic activity should disqualify it as a repository site.

### **No Need To Build A Repository At Yucca Mountain**

According to scientists and nuclear utility spokespersons, most waste at nuclear power plants and research facilities can be safely stored on site for 50 to 100 years. In its report to Congress in 1996, The Nuclear Waste Technical Review Board stated, "The methods now used to store spent fuel at reactor sites are safe and likely to remain safe for decades to come."

### **Taxpayers Will Bear Half The Financial Burden**

To date, the federal government has spent nearly \$7 billion on the process of finding, studying and developing a nuclear waste dump. The Nevada Nuclear Projects Agency estimates that about

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\$4 billion has gone into high-level nuclear waste studies at Yucca Mountain alone. 010102

But that is just the tip of the nuclear iceberg. According to an assessment done for the state of Nevada, the total cost of operating the proposed waste repository would be over \$53 billion. These costs were to be offset by a tax on nuclear power. DOE estimates this Nuclear Waste Fund will only provide a total of \$28 billion. U.S. taxpayers would have to make up the difference: over \$25 billion.

### Waste Transport Exposes Million To Radiation Risk

Thousands of waste shipments would travel through communities in 43 states bound for Yucca Mountain by heavy truck or rail. Department of Energy officials say the specially designed casks have been extensively tested and are almost indestructible. Nuclear Energy Institute videos show a 120-ton locomotive hitting a waste cask at 80 mph and a speeding tractor-trailer loaded with a waste cask smashing into a wall. Both NEI and DOE claim the casks were unaffected by the impact and showed no leakage.

But Nevada Nuclear Projects Agency Director Bob Loux says two of the five test casks failed. He says that the engineers who conducted the tests warned against using those films to demonstrate that the casks could withstand severe impacts. DOE's Sandia National Laboratory claimed a canister was dropped 2,000 feet from a helicopter and survived. The claims have been repeated numerous times over the years by government and industry representatives. DOE has since admitted those tests never took place. Regarding claims that test casks survived a 1,400 degree fire for 30 minutes, Loux said that the cask broke open shortly after the fire.

Today, irradiated nuclear fuel rods are stored at nuclear reactor sites around the nation. According to the DOE, the waste total increases by 2,000 metric tons a year. By 2010, there will be more than 80,000 metric tons of irradiated fuel waste. In addition, thousands of tons of high-level nuclear waste produced by other sites is stored around the nation—including highly dangerous plutonium from decommissioned nuclear warheads and millions of gallons of liquid waste. The volume of nuclear waste from the nation's existing nuclear reactors after 40 years of operation will exceed the 70,000 metric ton commercial nuclear waste capacity planned for Yucca Mountain.

4 According to a report by the U.S. Geological Survey, rainwater runoff from the Yucca Mountain site flows into nearby communities, flooding a 300 square mile area that includes the Nevada Test Site. The Department of Energy's Yucca Mountain Project spokeswoman said, "It's not news that the area floods, that's why it's called Forty-Mile Wash." The report concludes that the Amargosa River could transport contamination beyond the boundary of Yucca Mountain and the Nevada Test Site during periods of moderate to severe runoff.

5... DOE has neglected the impacts of floodwater runoff into the Forty-Mile Wash or Topopah Wash, detailed in the U.S. Geological Survey report. DOE's supplement to the draft environmental statement also fails to address this issue.

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## Native American Claims To Yucca Mountain

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5 cont.

The USGS report found that radioactive water could travel as far as Death Valley, the home of the Timbisha Shoshone Tribe. This raises the final, fatal problem with the proposed repository at the Yucca Mountain site: the Treaty of Ruby Valley. The DOE must address the legitimate claims of the Paiute Shoshone nation.

"Nothing in the Treaty of Ruby Valley ever sold, traded or gave any part of Newe Country to the United States of America. Nothing in this treaty said the United States of America could establish counties or smaller states within Newe Country. Nothing in this treaty said the United States could establish settlements of U.S. citizens who would be engaged in any activity other than mining, agriculture, milling and ranching. Yet the United States of America has established political jurisdictions in the form of counties, cities and the states of Nevada, Idaho, Utah and California that overlap into Newe Country. The United States of America did establish settlements of its citizens within Newe Country for purposes other than those provided in the Treaty of Ruby Valley. And the United States of America has used other parts of Newe territory for military purposes other than those stipulated in the Treaty. The United States of America have also used parts of Newe Country that were not included in the Treaty of Ruby Valley."

Newe Sogobia and the United States of America Renewal of International Relations on the Basis of Mutual Government-to-Government Respect (c) 1994 Rudolph C. R'ser, Center For World Indigenous Studies P.O. Box 2574 Olympia, Washington U.S.A. 98507-2574

Thank you for your consideration of these comments.

Respectfully submitted,



Louis Zeller

## Attachment

*Color contour map of ground magnetic observations along central block traverses. Red colors, magnetic highs; blue colors, magnetic lows; gray lines, mapped faults.*

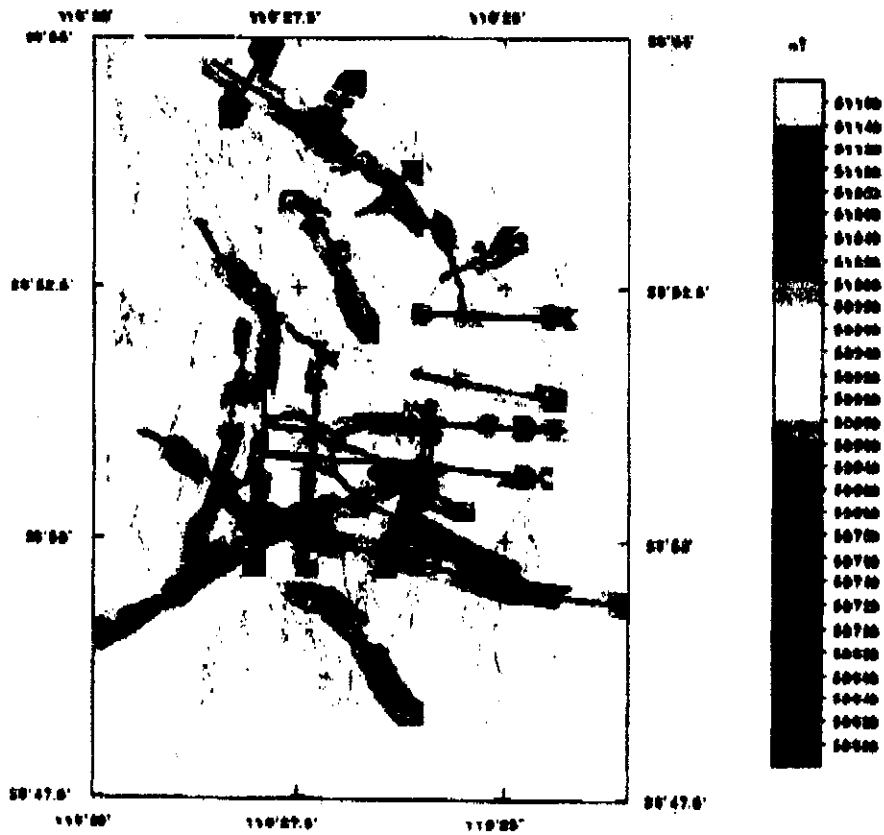
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GROUND MAGNETIC CONTOUR MAP

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<http://wrgis.wr.usgs.gov/docs/gump/ymp/centralblock/cb100kmag.gif>

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